Population Reports

Liz Gilbert, Courtesy of the David and Lucile Packard Foundation

Highlights

Contents

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Meeting the Urban Challenge

Every week urban areas gain another one million people. Within four years half of the world's population will live in urban areas. How governments and communities meet the concurrent challenges of rapid urbanization, poverty, development, and protection of the natural environment will largely determine the world's future.

In the future, nearly all population growth worldwide will take place in urban areas of developing countries. By 2015, the UN projects, there will be 21 "megacities" of at least 10 million people—all but 4 in developing countries. While big cities attract attention, most of the world's urban population lives in smaller settlements.

Urban areas in developing countries are at the crux of the struggle to achieve better living standards. Worldwide, urban areas large and small have become engines for economic growth in the global economy as well as centers of diversity and change. Yet, facing rapid population growth, rising poverty levels, and often inadequate public institutions, many urban areas are hard pressed to provide infrastructure, housing, services, and opportunities. If they are not able to meet people's needs, poverty and hopelessness will increase.

How can conditions improve for the growing millions of urban residents? Meeting the challenges posed by rapid urbanization will be as important to the future as addressing rapid population growth itself has been in the past half century.

Developing World Becoming Urban

The developing world as a whole has been predominantly rural but rapidly is becoming urban. In 1975 only 27% of people in the developing world lived in urban areas. In 2000 the proportion was 40%, and projections suggest that by 2030 the developing world will be 56% urban. Although the developed world is already far more urban, at an estimated 75% in 2000, urban areas of developing countries are growing much faster, and their populations are larger.

Rapid urban growth reflects migration of people to cities as well as natural population increase among urban residents. Rural areas have virtually stopped gaining population. Among regions as a whole, only in sub-Saharan Africa and Oceania will rural populations grow at all in the future.

Urban Challenges

Growing urban poverty is a major concern. About 30% of the poor now live in urban areas. By 2035 the proportion is projected to reach 50%. Most of the urban poor live in slums and squatter settlements, without adequate access to clean water, sanitation, and health care. While health and child survival rates are better in urban than rural areas on average, they often are worse for the poor than for other urban residents.

Pollution of the water and air endangers the health of urban residents, causes chronic illnesses, and kills millions. Many municipalities cannot keep up with the soaring demand for water. Where access to clean water is scarce, sanitation is poor, contributing to a variety of water-related diseases.

As urban areas grow in population, they expand outward as well as upward, often overwhelming the natural environment and destroying ecosystems. Urban areas in developed countries, where consumption levels per capita are much higher than in developing countries, have a greater impact on the environment. But rapid urban expansion, rising consumption levels, and unplanned growth of many cities in developing countries also strain the natural resource base.

What Can Be Done?

Many urban settlements face a crisis. Their populations are growing so fast that local economies, public services, and infrastructures cannot keep up. Rapid population growth can make it ever harder to improve urban conditions. Thus slower growth would ease pressures and buy time to act effectively.

Better local governance is key to meeting urban challenges. Shifting authority from central governments to municipalities can help make policies, plans, and actions more responsive, especially to the urban poor. Donors and international agencies can focus more on strengthening institutional capabilities needed to meet the challenges of rapid urban growth. Urban planning can do more to address such interrelated issues as land use, slum upgrading, improved water supply, sanitation, waste management, and more efficient transportation.

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An Urban Future

The world is near a historic turning point. Within four years half of the world's population will be urban. At that time, the projected urban population of 3.2 billion will be larger than the entire global population in 1967, just 40 years earlier. (For the definition of "urban," see box.)

Urban areas are gaining an estimated 67 million people per year—about 1.3 million every week (131). By 2030 about 5 billion people are expected to live in urban areas—60% of the projected global population of 8.3 billion (131) (see Figure 1).

Over the next 30 years virtually all population growth will take place in urban areas of developing countries (see Figure 2). The urban population of developing countries is projected to grow at an average annual rate of 2.4%, twice the overall annual population growth rate of 1.2% in the developing world (131). Although the urban population of developed countries also will grow faster than their total population, and the developed world will remain far more urbanized than the developing world, urban growth in developing countries is more rapid and, in absolute numbers, much greater.

Large cities have existed for centuries—for example, present-day Xi'an, China, (ancient Changan) had 800,000 inhabitants as long ago as 750 AD, and ancient Baghdad reached over 1 million population between 775 and 935 AD (23). It was not until the industrial revolution in the late 19th century, however, that accelerated population growth and migration sped the growth of cities to historic new levels (39). Between 1950 and 2000, primarily reflecting population trends in developing countries, the world's urban population more than tripled, rising from 750 million to 2.9 billion (131).

Defining "Urban"

What is urban? What is a city? The terms "city" and "urban" are often used interchangeably, and there is no international agreement on their definition. Almost all national governments agree that settlements of 20,000 or more people are urban, but some consider smaller settlements to be urban as well, with various cut-off points. Few, however, would consider a small urban center of 1,000 to 2,000 inhabitants to be a city (44). Thus, while the term "urban" can refer to settlements of all population sizes, most people reserve the term "city" for urban centers with large populations, a practice that this issue of **Population Reports** follows.

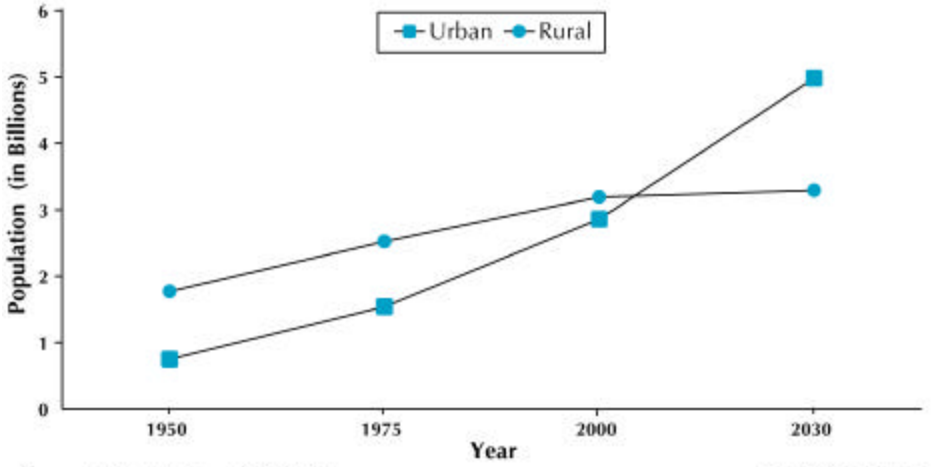
Urbanization statistics depend to a certain extent on how countries define urban settlements, especially countries with large populations, such as China and India. For example, most of India's rural population lives in villages with 500 to 5,000 inhabitants. If the government of India classified settlements of this size as urban, as some countries do, instead of using the cutoff of 5,000 or more inhabitants, India would have a predominantly urban population (105).

Most governments define urban settlements based on one or a combination of criteria, including population size, population density, and social and economic factors, such as the proportion of the labor force engaged in nonagricultural activities; the administrative or political status of a locality, such as national, provincial, or district capitals; or census designations (44). In the UN *World Urbanization Prospects 1996 Revision*, for example, 46% of the represented countries defined "urban" based on administrative criteria; 22% used population size and sometimes population density; 17% used other criteria; 10% had no definition; and 4% defined their country as either entirely urban or entirely rural (130). In the various revisions of *World Urbanization Prospects*, from which this issue of **Population Reports** draws data on urbanization trends, the UN's estimates are based on how each country defines "urban" and "rural" (130).

Tokyo—world's largest urban area. In the near future, the developed world will remain more urban than the developing world, but urban growth in developing countries will be more rapid and, in absolute numbers, much greater. Photo: D. Hinrichsen

Figure 1. World's Urban Population Growing Rapidly

Estimated and Projected World Urban and Rural Populations, 1950–2030



Source: United Nations, 2002 (131)

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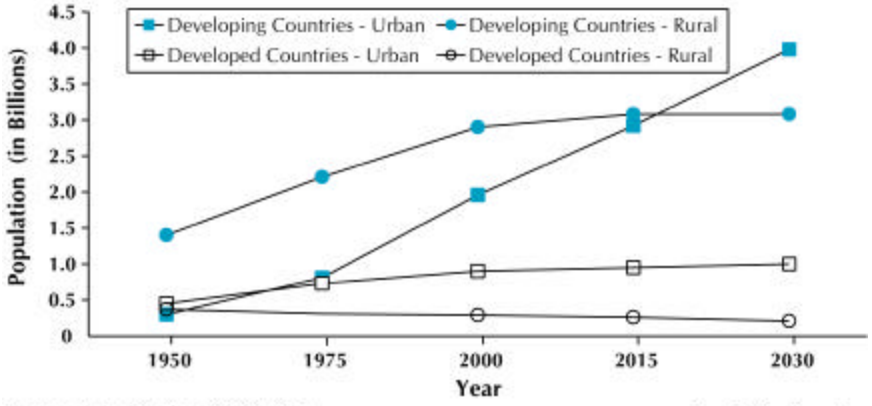
Figure 2. Urban Growth Most Rapid in Developing Countries

Estimated and Projected Urban and Rural Populations of Developing and Developed Countries, 1950–2030



Source: United Nations, 2002 (131)

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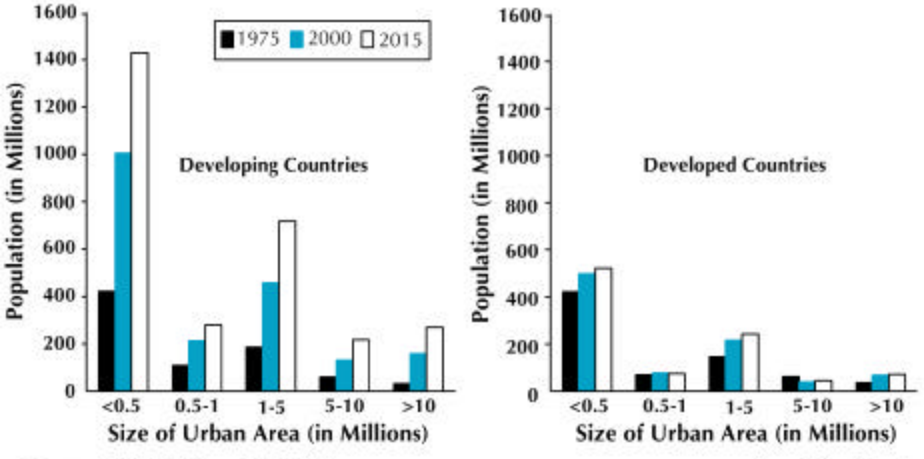
Figure 3. Population Distribution of Developing and Developed Countries by Size of Urban Area and Year



Source: United Nations, 2002 (131)

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In the next 30 years the urban population of developing countries is projected to double, from just under 2 billion in 2000 to nearly 4 billion by 2030. In contrast, the urban population of developed countries is projected to increase hardly at all—from 900 million in 2000 to 1 billion in 2030. The developed countries are already 75% urban (131).

As the developing world's population grows, the number of big cities will grow substantially. In 2000 there were 388 cities in the world with 1 million or more residents. By 2015 there will be a projected 554 such cities. Of these, 426—over three-quarters—will be in developing countries. The United Nations (UN) coined the term "megacities" initially to describe cities with 8 million or more inhabitants; the UN's present threshold for megacity status is 10 million. Currently, the UN lists 17 megacities, all but 4 in developing countries. By 2015, the UN projects, 21 cities will have at least 10 million residents (131) (see Table 1).

Big cities capture attention. Still, most of the world's urban population lives in smaller urban settlements, not the largest urban agglomerations. In 2000 about 37% of the world's urban population lived in cities of 1 million or more; 53% lived in urban centers with fewer than 500,000 inhabitants. The UN projects that the largest share of the increase in the urban population through 2015 will be in such smaller urban areas, reflecting both population growth and reclassification of rural areas to urban (131) (see Figure 3).

Differences within countries. Large differences in urban patterns exist within countries. Urban areas range from large cities to small market towns. Generalization about urban areas is often difficult because each urban center has its own unique social, political, and economic setting that helps shape its future growth and development. In Latin America

and the Caribbean, for instance, urban areas range from large cities with substantial economic and political importance, such as São Paulo, Brazil, and Mexico City, to small urban centers of various sizes, growth rates, and economic bases (132).

Developing World Urbanizing

As noted, most of the world's urban population—like most of the world's total population—lives in developing countries. In 2000, for example, China had 464 million urban residents, India had 279 million, and Brazil, 138 million—together almost as many as in the entire developed world (131).

With the exception of Latin America, however, the developing world remains much less urban than the developed world. In Latin America, as in the developed world, about 75% of the population lives in urban areas. By 2030 an even greater share, 84%, will be urban, according to projections by the UN. In developing countries as a whole, 40% of the population now lives in urban areas, rising to a projected 56% by 2030. By then every developing region is projected to have an urban majority (131).

The level and pace of urbanization will vary substantially among developing regions and countries (131). Over the next 30 years the already urbanized Latin America and Caribbean region is projected to gain only another 217 million urban residents. In contrast, Asia will gain over 1.3 billion (124, 131). India's urban areas will grow by a projected 297 million residents, Pakistan's by 86 million, and Bangladesh's by 64 million (131). By 2030

D. Hinrichsen

Shanghai is home to some 13 million people. Together, China, India, and Brazil have about as many urban inhabitants as the entire developed world. In the future, virtually all population increase will be in the urban areas of developing countries.

Table 1. Megacities Past, Present, and Future

Cities with 10 Million or More Inhabitants, 1950, 1975, 2001, and 2015 (Population in Millions)

1950		1975		2001		2015	
City	Population	City	Population	City	Population	City	Population
1. New York	12.3	1. Tokyo	19.8	1. Tokyo	26.5	1. Tokyo	27.2
		2. New York	15.9	2. São Paulo	18.3	2. Dhaka	22.8
		3. Shanghai	11.4	3. Mexico City	18.3	3. Mumbai[1]	22.6
		4. Mexico City	10.7	4. New York	16.8	4. São Paulo	21.2
		5. São Paulo	10.3	5. Mumbai[1]	16.5	5. Delhi	20.9
		Total	68.1	6. Los Angeles	13.3	6. Mexico City	20.4
				7. Kolkata[2]	13.3	7. New York	17.9
				8. Dhaka	13.2	8. Jakarta	17.3
				9. Delhi	13.0	9. Kolkata[2]	16.7
				10. Shanghai	12.8	10. Karachi	16.2
				11. Buenos Aires	12.1	11. Lagos	16.0
				12. Jakarta	11.4	12. Los Angeles	14.5
				13. Osaka	11.0	13. Shanghai	13.6
				14. Beijing	10.8	14. Buenos Aires	13.2
				15. Rio de Janeiro	10.8	15. Metro Manila	12.6
				16. Karachi	10.4	16. Beijing	11.7
				17. Metro Manila	10.1	17. Rio de Janeiro	11.5
				Total	238.6	18. Cairo	11.5
						19. Istanbul	11.4
						20. Osaka	11.0
						21. Tianjin	10.3
						Total	340.5

[1] Formerly known as Bombay
[2] Formerly known as Calcutta
Source: United Nations, 2002 (131)
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Table 2. Population Distribution by Region, 1975, 2000, and 2030

	Population (in Millions)						% Urban		
	1975		2000		2030				
Region	Urban	Rural	Urban	Rural	Urban	Rural	1975	2000	2030
Africa	102	304	295	498	787	702	25	37	53
Asia	592	1805	1376	2297	2679	2271	25	37	54
Latin America & Caribbean	198	124	391	127	608	116	61	75	84
Europe	455	221	534	193	540	131	67	73	80
North America	180	64	243	71	335	61	74	77	84
Oceania*	15	6	23	8	32	10	72	74	77

*Oceania = Australia, New Zealand, Melanesia, Micronesia, and Polynesia

Source: United Nations, 2002 (131) **Population Reports**

John Curley

A mother and child in Mejicanos, El Salvador, visit a dental clinic. Cities attract people from the countryside because they provide more jobs, education, health care, and other services.

Africa, with a projected 787 million urban residents, will be second only to Asia's 2.7 billion in the size of the urban population (see Table 2).

Some researchers contend that urbanization in sub-Saharan Africa has slowed in recent years in response to the region's depressed economies. In the 1970s and 1980s the gap between rural and urban incomes narrowed or even reversed (26, 38, 58-60). As a result, migration to urban areas declined, and some urban migrants returned to rural areas (91). UN projections for Africa that point to continued urban growth do not reflect these recent economic and demographic trends (92, 105, 114). Whether or not sub-Saharan Africa urbanizes as the UN projects, the region's depressed economies have severe consequences for its urban areas and residents (137).[1]

[1] Projections of urban growth in sub-Saharan Africa also suffer from the lack of recent and reliable censuses for many countries (92, 105, 114). The UN derives its urban projections for some countries not from current trends but rather from extrapolation of urban growth rates from earlier years for which census data are available. Of the 53 African countries in the UN *World Urbanization Prospects 1992 Revision*, for example, only 31 had conducted a census since 1980. For the others, urbanization estimates are based on censuses from the 1970s, and from the 1960s for three countries (95).

Explaining urban growth. Settlements expand and become urban for different reasons. The Upper Valley of Rio Negro and Neuquén, Argentina, grew from 5,000 inhabitants to 400,000 between 1900 and 1990, with more than 80% of the population urban, as the area became prosperous from agricultural exports. In contrast, Cuautla, Mexico, grew from a small market town to a city of over 120,000 inhabitants because of tourism (132).

While there are substantial differences in the reasons behind and characteristics of urban growth, overall in developing countries rapid urban population growth reflects three basic factors: (1) migration from rural areas and from other urban areas; (2) natural population increase (births minus deaths) among urban residents; and (3) reclassification of previously rural areas as urban as they become built up and change character. During the initial phases of urbanization in a country, migration from rural to urban areas tends to play a greater role than natural population increase in urban areas. As a greater share of the total population lives in cities, however, natural population increase within them surpasses migration in importance (63, 158). As natural population increase slows, migration can once again play a dominant role in urban population growth—for example, if economic opportunities in urban areas expand rapidly while those in rural areas do not (15).

Because so many people in developing countries are moving from the countryside to urban areas, population growth in rural areas is at a virtual standstill. Among regions, only in Africa and Oceania will rural populations grow at all in the future. In contrast, Asia's rural population is projected to decrease from an estimated 2,297 million in 2000 to 2,271 million in 2030 (see Table 2). Certain countries in Asia, however, are projected to have continued rural population growth, including Bangladesh, India, Nepal, and Pakistan (131).

People will continue to leave rural areas and move to urban centers to escape adverse rural conditions (push factors). At the same time, many urban areas will continue to attract people from the countryside because they generally offer more opportunity (pull factors).

Factors that push people out of the countryside include the deteriorating quantity and quality of agricultural lands, poor market infrastructures, and lack of supporting institutions, such as sources of credit for small-scale farmers. In Latin America unequal distribution of land—mainly a legacy of colonialism but also due to commercialization of agriculture—has pushed many rural residents into urban areas (63).

Factors that pull residents to some urban areas include access to better jobs, education, health care, and higher living standards. Big cities in particular are economic centers. Bangkok alone, for example, contains only 12% of Thailand's total population but contributes 38% of the country's Gross Domestic Product (137).

Most of the world's largest cities have higher standards of living than smaller urban centers or rural areas, including longer life expectancy and a larger proportion of people with access to piped water, sanitation, schools, and health care (48, 105). Large urban areas have achieved better average living standards mainly because of their economies of scale in providing infrastructure and basic services. High population densities lower the per capita cost of providing clean water, sanitation, waste collection, electricity, and telecommunications (84). For similar reasons, many large cities have succeeded in attracting business investment (105).

As an increasing share of rural-to-urban migrants settle in smaller urban areas—which generally offer lower living standards and fewer opportunities than the big cities—global poverty levels can be expected to rise unless something can be done soon to improve conditions in smaller urban areas. One of the main challenges of urbanization will be to spread the benefits of development from big cities to smaller urban centers, principally through effective decentralization and the transfer of resources and authority from central to local levels. Many smaller urban areas can take advantage of access to important resources, favorable geographic location, and advances in transportation and communication systems to stay competitive with major urban areas in the global economy (68).

The Urban Poor

Most poor people in developing countries live in rural areas (140). But urban poverty is widespread, too, and it is growing.

The World Bank estimates that, worldwide, 30% of poor people live in urban areas. By 2020 the proportion is projected to reach 40%, and by 2035 half of the world's poor people are projected to live in urban areas (96).

In 1988 the World Bank estimated conservatively that some 330 million urban poor in the developing world were living on less than US$1 a day (151).[2] In 2000 the estimate had increased to 495 million (153). In over half of developing countries with data on poverty, as defined by the countries themselves, at least one urban resident in every five lives below the national poverty line (157) (see Table 3).[3]

Sub-Saharan Africa has some of the world's highest levels of urban poverty, reaching over 50% of the urban populations in Chad, Niger, and Sierra Leone. Countries of North Africa and the Near East have urban poverty levels near or below 20%. In Asia the highest percentages are in India, at 30%, and Mongolia, at 38%. In Latin America and the Caribbean, levels of urban poverty vary widely, from 8% of the urban population in Colombia to 57% in Honduras (157) (see Table 3).

These income-based statistics should be interpreted cautiously; the true extent of urban poverty is greater than they suggest. Poverty levels estimated on the basis of income alone do not account adequately for the larger numbers of people with such impoverishment as inadequate housing and lack of clean water and sanitation (74, 89, 132).

Moreover, urban poverty may be even more debilitating than rural poverty because in urban areas, unlike rural areas, access to virtually all goods and services depends

Table 3

Percentage of Population Living Below the National Poverty Line in Urban and Rural Areas

Region & Country	Urban	Rural
SUB-SAHARAN AFRICA		
Cameroon 1984	44	32
Chad 1995–96	63	67
Ghana 1992	27	34
Kenya 1992	29	46
Lesotho 1993	28	54
Madagascar 1993–94	47	77
Niger 1989–93	52	66
Nigeria 1992–93	30	36
Sierra Leone 1989	53	76
Tanzania 1993	24	50
Zambia 1991	46	88
Zimbabwe 1990–91	10	31
NORTH AFRICA & NEAR EAST		
Algeria 1995	15	30
Egypt 1995–96	23	22
Morocco 1998–99	12	27
Tunisia 1990	9	22
Yemen 1992	19	19
ASIA		
Bangladesh 1995–96	14	40
Cambodia 1997	21	40
China 1998	<2*	5
India 1994	30	37
Laos 1993	24	53
Mongolia 1995	38	33
Nepal 1995–96	23	44
Pakistan 1991	28	37
Philippines 1997	21	51
Thailand 1992	10	15
Vietnam 1993	26	57
LATIN AMERICA & CARIBBEAN		
Brazil 1990	13	33
Colombia 1992	8	31
Costa Rica 1992	19	25
Dominican Republic 1992	11	30
Ecuador 1994	25	47
El Salvador 1992	43	56
Guatemala 1989	34	72
Honduras 1993	57	51
Nicaragua 1993	32	76
Panama 1997	15	65
Paraguay 1991	20	28
Peru 1997	40	65
Trinidad and Tobago 1992	24	20

* New statistics released by China's Ministry of Civil Affairs indicate that 6% of the nation's 320 million urban residents live in extreme poverty (4).

Source: World Bank, 2002 (157)

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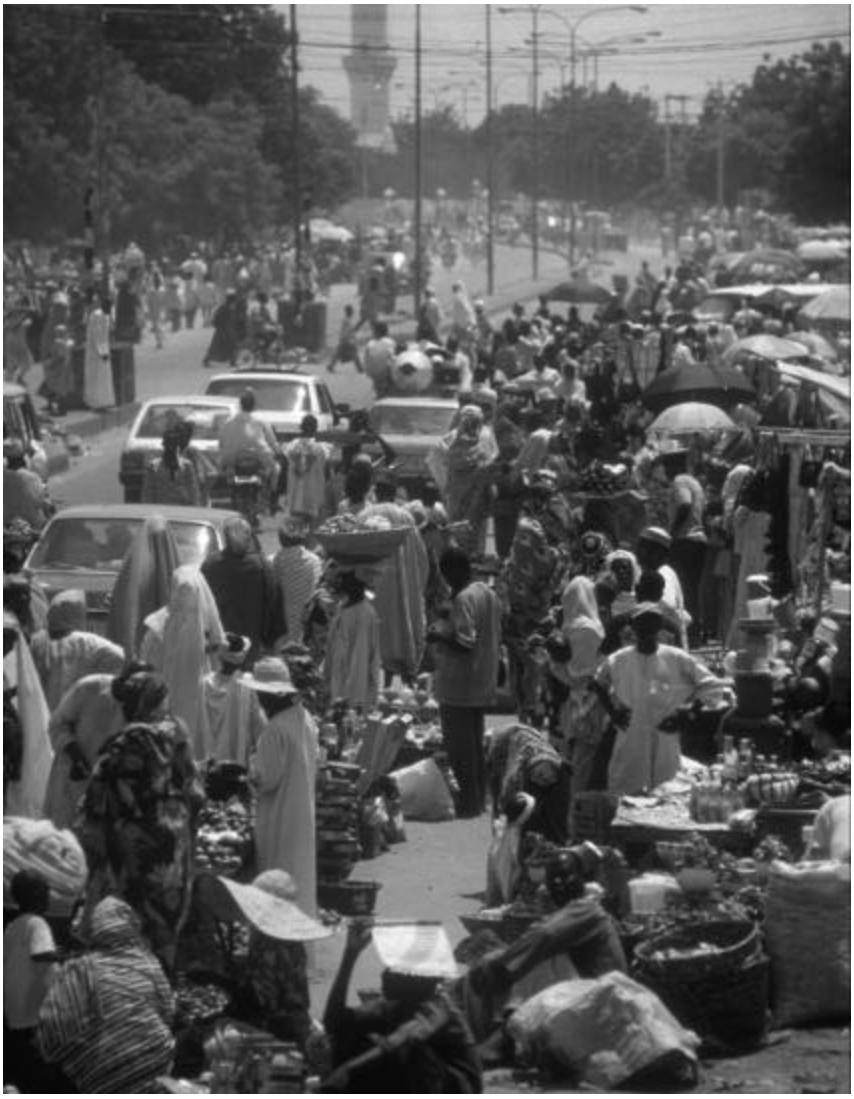
[2] The World Bank sets the income poverty line at US$1 a day per person for international comparisons (157).

[3] Developing countries often set their own income poverty lines, usually defined as the income needed to buy a specified amount of food plus a few essential nonfood items (138).



Liz Gilbert, Courtesy of the David and Lucile Packard Foundation

Vendors crowd the streets of a Nigerian city. In many developing countries urban dwellers often work in the informal sector, with its low wages and long hours. Economic crises in recent years have made steady jobs harder to find.

on having a cash income. Furthermore, services that governments usually provide free in rural areas, such as schooling, usually carry costs for households in urban areas—for example, school fees and expenditures for school uniforms, books, and transportation (3, 104). Urban residents have to buy most of their food, while rural residents grow a substantial portion of their own food, and food prices often are higher in urban areas than in the countryside. Urban households spend 60% to 80% of their income on food (101) and pay up to 30% more for it than rural households (1).

Insufficient Incomes

Many developing countries experienced economic crises during the 1990s (156). Consequently, poverty has spread as wages have fallen and the prices of goods and services have risen. As wages slip, people buy less, and the falling demand for goods and services puts even more people out of work. In several Asian countries urban managers and central government officials have reported that the region's economic crisis is particularly harming urban economies. Urban workers have lost jobs and income due to reduced demand for manufactured goods, transport, and other services. In addition, prices of food, utilities, and essential imported consumer goods have increased as currency values have fallen (3).

Most urban poverty results not from unemployment but instead from the lack of well-paying, steady jobs. The unemployment rate itself is relatively low in urban areas of most developing countries (41, 100). For example, in 155 surveyed cities in developing countries, three-quarters had unemployment rates at or below 15% (157). Nevertheless, poverty has risen as fewer people can find steady jobs with adequate wages.

As economic conditions worsen, a growing percentage of people shift from employment in the formal economy to work in the informal labor market. In 30 of 40 developing countries surveyed by the International Labor Organization (ILO) in 1999, employment in the urban informal sector constituted over one-third of total urban employment. Urban informal-sector employment ranged from 15% in Turkey to 84% in Uganda. Participation in the urban informal sector was highest in sub-Saharan African countries, with rates above 50% in two-thirds of countries surveyed (56).

Employment in the informal sector is less secure, and incomes are lower than in manufacturing and other formal-sector jobs (2, 28, 56). The informal sector is characterized by unincorporated businesses owned by households and small-scale enterprises, based on casual employment, kinship, or personal and social relationships rather than contractual arrangements (56).

Within the informal sector the urban poor work in a variety of jobs—for example, as street vendors and petty traders; as taxi drivers and in other small transport; in personal services such as shoe shining; in security services such as night watchmen or car parking attendants; in janitorial services; and also begging and commercial sex (14, 28, 37, 101). These diverse activities share the common thread of low status, low wages, long hours, and often dangerous and insecure conditions.

Inadequate Housing and Services

Around the world over 1 billion urban residents live in inadequate housing, mostly in slums and squatter settlements, where living conditions are poor and services are insufficient (137). One-quarter of all urban housing units in developing countries are temporary structures, and more than one-third do not conform to building regulations.

The situation is worst in sub-Saharan Africa, where 60% of urban housing units are temporary structures, and about half do not conform to building regulations (134).

Urban slums include both high-density dwellings, such as high-rise apartments, and squatter settlements and shanty-towns, where people occupy vacant land and illegally build shacks for themselves (134). Many illegal settlements are built on land poorly suited for housing—for instance, on floodplains or on steep hillsides—and are especially prone to damage from natural disasters (132) (see p. 13).

Slum residents usually lack security of tenure—that is, the right of legal access to and use of the land and buildings they occupy (133). Each year several million urban dwellers are forcibly evicted (132). An estimated 20 million to 40 million urban families are homeless, some because they have been evicted and some because they cannot afford any housing, even illegally (137).

It is particularly difficult for the urban poor to obtain tenure because property registration processes are inefficient, complicated, and expensive (137). The process is even more difficult in the case of informal settlements. Many governments hesitate to legalize them for fear of encouraging even more illegal settlement (3, 120).

Legal housing, however, usually is too expensive for the urban poor, or it is scarce (132). Outdated government regulations controlling land acquisition and construction of housing, coupled with rapid urban population growth, have made land scarce, which in turn has inflated housing prices. Estimates from various countries show that it would take low-income households 15 to 30 years of saving 30% to 50% of their incomes to afford a legal house meeting minimum standards. In reality, most of the urban poor earn too little to save any money at all (3). Furthermore, they lack access to credit from commercial lending institutions (132).

People in slums often must pay more for services than other urban residents, and they receive services of lower quality (137). The scarcity of public water supplies forces many low-income urban residents to use other water sources, often private water vendors who charge many times the public rate (136, 150). In Istanbul, Turkey, water from private vendors costs 10 times the public rate, while in Mumbai (formerly Bombay), India, vendors charge 20 times more (83). Poor households often spend 5% to 10% of their incomes to buy water (44, 136).

Health Burdens

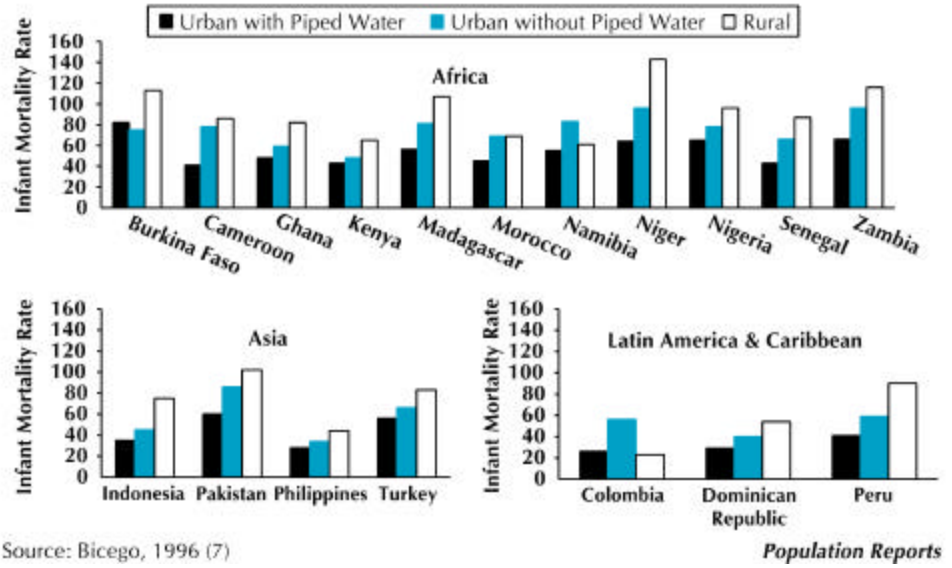
On average, the health of urban residents in developing countries is better than that of rural dwellers, in part because urban areas usually offer better health care and healthier living conditions than most rural areas.

Infant and child mortality rates are lower in urban areas than in the countryside. The average child born in an urban area has a much better chance of survival than does a rural child. In 54 of 57 countries with data from the Demographic and Health Surveys (DHS), infant mortality rates—deaths before age one per 1,000 live births—were lower in urban than in rural areas. Similarly, child mortality rates—deaths to children ages one to five per 1,000 children surviving to age one—were lower in urban than in rural areas in 56 of the 57 surveyed countries (30).

Within urban areas, however, the urban poor face many more health risks than the average urban resident. In 17 of 18 countries studied with DHS data, for example, infant mortality was higher in the less developed urban areas than in the more developed urban areas (with level of development indicated by access to piped water) (7) (see Figure 4). Health conditions for the urban poor are sometimes even worse than they are for the rural poor (7, 161, 163).

CEDPA/Nepal

Figure 4. Infant Mortality Rates by Residence and Access to Piped Water, Selected Countries, 1990-1994



Source: Bicego, 1996 (7)

Population Reports

In large cities of developing countries, child mortality is highest among children whose mothers recently migrated from rural areas and those who live in low-quality housing (11). The extent of childhood illnesses is closely related to poverty levels and to the quality and extent of health care, clean water supply, and sanitation (132).

Access to services. The urban poor are more vulnerable to poor health and environmental hazards because they are more likely than others to lack adequate housing, sanitation, and other basic services (107, 132). In each of 32 developing countries with DHS data, poor urban households were less likely than other urban households to have access to basic services, including piped water, a flush toilet, and electricity. Poverty status was defined by household ownership of certain consumer items, such as a refrigerator and television, as well as housing quality, including the number of sleeping rooms (48).

Basic services needed for good health often do not reach the urban poor because municipal authorities do not recognize many informal settlements for political and administrative reasons, and thus these areas are not eligible for services. In some cases, slum areas are not classified as urban precisely because they lack services (120).

Also, as noted, the urban poor often settle on land not suitable for housing. Extending infrastructure such as roads, water mains, and sewer lines can be difficult because of rough terrain. Moreover, such neighborhoods often are developed haphazardly, without planning to allow space for infrastructure. In order to lay water or sewer pipes, the utility authorities often must remove or relocate many houses (120).

In addition, governments and donor agencies give low priority to providing such services as primary health care, basic education, family planning, water and sanitation, and nutrition, according to an analysis of 17 developing countries around the world (45). The UN and the World Bank agree that, on average, 20% of national budgets in developing countries and 20% of international aid should be allocated to extending these basic services to all people—both urban and rural. In the 17 countries studied, however, the average expenditure on these services was only 12% of total government spending—from 8% in Lebanon to 17% in Nepal. Similarly, in few instances did spending on basic services account for 20% or more of donor assistance (45).

In urban areas the poor usually suffer most from a lack of basic services but are the last to be included in urban planning and infrastructure improvements. Their disadvantage mainly reflects their lack of political power and influence (137).

Pollution and Health

Pollution causes many deaths and much illness among urban residents. Particularly in developing countries, urban water supplies are often fouled with wastes, and clean water is scarce. A pall of atmospheric pollution hangs over many big cities, both in developed and developing countries. Indoor air pollution is also widespread, not only in rural areas of many developing countries but also in urban areas.

Water and Sanitation

Urbanization can dramatically increase per capita use of freshwater. Fast population growth with accelerated urbanization, combined with scarce water supplies and poor sanitation, means that governments often cannot supply enough water to meet demand (150). The number of urban residents without access to improved water sources rose from 113 million in 1990 (5% of the total urban population) to 173 million in 2000 (6% of the total urban population), according to a study by WHO and UNICEF (see Table 4). WHO and UNICEF define "improved" water sources as those that are better than previous sources. The term does not necessarily mean that they are safe for household use (150).

Water is often scarce in urban areas of developing countries. For example, in Sierra Leone in 2000 the piped water supply covered just 23% of the country's 1.8 million urban dwellers (150). Moreover, at least one-third of urban water supplies in Africa and Latin America and

Table 4

Access to Improved[1] Water and Sanitation in Urban Areas by Region, 1990 and 2000

	Population Without Access (in Millions)		Population with Access (in Millions)		% Population with Access[2]	
	1990	2000	1990	2000	1990	2000
WORLD						
Water	113	173	2179	2672	95	94
Sanitation	415	403	1877	2442	82	86
AFRICA						
Water	31	44	166	253	84	85
Sanitation	30	46	167	251	85	84
ASIA						
Water	57	98	972	1254	94	93
Sanitation	339	297	690	1055	67	78
LATIN AMERICA & CARIBBEAN						
Water	26	29	287	362	92	93
Sanitation	46	51	267	340	85	87
OCEANIA						
Water	0	0	18	21	100	98
Sanitation	0	0	18	21	99	99
EUROPE						
Water	0	3	522	542	100	100
Sanitation	0	8	522	537	100	99
NORTH AMERICA						
Water	0	0	213	239	100	100
Sanitation	0	0	213	239	100	100

[1] The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation defines "improved" sources as those that are better than previous sources, although not necessarily safe for household use.

[2] Due to rounding, figures may not total 100% even if the population without access is shown as 0.

Source: WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, 2001 (150)

Population Reports

one-half in Asia operate only intermittently (150). Most residents of Mombasa, Kenya, for example, have water pipes in their homes, but water flows into them for an average of only three hours per day (44, 136). When piped water supplies are inconsistent, people turn to other sources of water that are usually more expensive and/or unsafe (150).

In New Delhi air pollution, mostly from vehicle exhausts, obscures the surrounding buildings. Most countries face severe pollution problems as their cities grow rapidly.

Urban water supplies often are contaminated from a variety of sources, including discharge of untreated industrial wastes, leaching from waste dumps into surface and ground water, inadequate treatment of sewage, and poor solid waste management (9). Few cities in developing countries have adequate sewerage systems, and they often are limited to more advantaged areas. Purification and recycling of wastewater in sewage treatment plants is rare. In Asia, for example, treatment plants process only an estimated 35% of wastewater, and in Latin America and the Caribbean, about 14% (150). Worldwide, two-thirds of the sewage from urban areas is pumped untreated into lakes, rivers, and coastal waters (160).

Even fewer people have access to improved sanitation facilities than to improved water supplies. While the numbers with access increased slightly between 1990 and 2000 (see Table 4), the increase just kept pace with population growth (150). According to WHO, nearly two-thirds of urban populations in developing countries do not have adequate sanitation in that they lack a flush toilet, a sanitary latrine, or a pit that can be covered over (160).

Water-Related Diseases

Worldwide, about 2.3 billion people suffer from diseases that are linked to water problems (67, 126, 160). Water-related diseases kill millions of people each year, prevent millions more from leading healthy lives, and undermine development efforts (79, 82). Nearly half of urban residents in Africa, Asia, and Latin America suffer from one or more of the main diseases associated with the inadequate provision of water and sanitation (162).

Water-related diseases include diarrheal diseases, schistosomiasis, trachoma, ascariasis, trichuriasis, and hookworm disease (93). Diarrheal diseases are the major waterborne malady, responsible for 90% of the health problems related to water supply and sanitation (53). An estimated 4 billion cases of diarrheal disease occur every year, causing 3 million to 4 million deaths, mostly among children (82, 144, 148, 152). Other diseases such as cholera can become endemic when there is poor food hygiene, lack of sanitation, or unsafe drinking water (160).

Outdoor Air Pollution

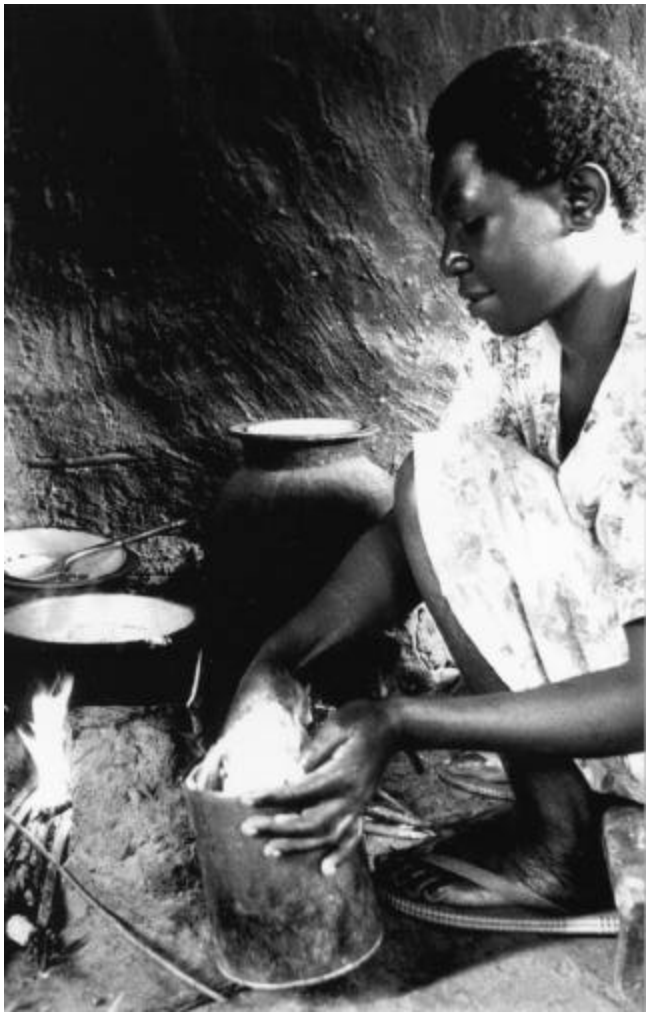
The air in large cities is often unhealthy. In Latin America, for example, cities such as São Paulo and Santiago have recorded levels of suspended particulate matter that average 100 to 400 micrograms per cubic meter of air. By comparison, WHO guidelines call for levels no higher than 60 to 90 micrograms per cubic meter (62).

Suspended particulate matter—small particles floating in the air—is generated from natural sources, such as volcanoes and dust storms, as well as from human activities such as vehicle, incinerator, and industrial emissions. Due to their small size, suspended particulate matter tends to float longer in the air than larger particles, which usually settle quickly. Suspended particulate matter is small enough to be inhaled (57).

Many Latin American cities also struggle with high levels of ozone. The ozone concentration in Mexico City, measured in 1995, was 10 times the natural atmospheric concentration, twice the maximum concentration permitted in Japan or the US, and high enough to damage vegetation and human health (34, 47, 76). In Santiago high ozone levels afflict the city for an average of 150 days a year (112). Ozone is a secondary pollutant formed when oxides of nitrogen and unburned volatile organic hydrocarbons, mostly from vehicle exhausts, combine in the atmosphere with oxygen in the presence of sunlight. Ozone is a main component of atmospheric smog (not to be confused with the stratospheric ozone layer, which protects the earth from harmful ultraviolet radiation from the sun) (34, 47).

Many Asian cities face similar pollution problems. In 1991 the following Asian cities exceeded WHO thresholds for suspended particulate matter and sulfur dioxide for much of the year: Beijing, 272 days; Jakarta, 173 days; Mumbai, 100 days; and New Delhi, 294 days (88). The situation has become worse since then, as the populations of these cities have grown rapidly over the past decade. With more people, the cities have more industry, more household fuel use, and more motor vehicles, and thus more air pollution (29, 44). In New Delhi, India, vehicle exhausts account for 70% of air pollution, according to a 2000 estimate (42).

In the developed world environmental standards generally are stricter than in developing countries, but energy consumption is greater, and levels of air pollution still often exceed national or international standards. In the US, for example, many cities studied had suspended par-


Bruce Nigel

In South Africa a woman prepares the family meal over an open fire. Indoor air pollution is a major health problem in rural areas, where many households use biomass fuels. But it also affects millions of the urban poor, particularly women.

ticulate matter levels ranging from 20 to 30 micrograms per cubic meter of air, while the national standard is no more than 15 micrograms per cubic meter (of fine particles less than 2.5 micrometers in diameter) (87, 122).

Death by breath. Worldwide, WHO estimates that 1.5 billion urban dwellers face levels of outdoor air pollution that are above the maximum recommended levels (162). About half a million deaths each year can be attributed just to particulate matter and sulphur dioxide in outdoor air (44). Outdoor air pollution is usually considered a problem of developed countries, as a result of their high level of industrial activity and vehicle use. More than 70% of deaths from outdoor air pollution occur in the developing world, however, because populations are larger and pollution standards often are less strict than in the more developed world (139).

In Asia, with half of the world's urban population, more than 1.5 million people die every year from diseases related to air pollution (65, 66). In India alone air pollution causes an estimated 40,000 premature deaths each year (44). An estimated 10,000 people die prematurely each year from air pollution in each of four major urban areas in China: Beijing, Chongqing, Shanghai, and Shenyang (19, 44).

Despite stricter air quality standards, developed countries are not spared the detrimental health effects of air pollution. For example, in the US nearly half of all urban residents are exposed to harmful levels of ozone (136). A recent study estimated that particulate pollution, mostly from vehicle emissions, causes up to one-fifth of all lung cancers in the US. Researchers found an 8% increased risk of lung cancer for every increase of 10 micrograms of particulates per cubic meter of air (90). In the United Kingdom, suspended particulates kill an estimated 24,000 people each year (139).

Worldwide, the health costs of urban air pollution are estimated to approach US$1 billion per year (136). In developed countries the health effects of air pollution cost about 2% of Gross Domestic Product (GDP) per year. In developing countries the cost is much higher—between 5% and 20% of GDP (136).

Indoor Air Pollution

Indoor air pollution is particularly a health problem in rural areas. Millions of poor people in urban areas also suffer from its effects, however. Some estimates suggest that, worldwide, urban indoor air pollution kills about 600,000 people annually (108, 160).

Indoor air pollution is a major health problem because, worldwide, almost 3 billion people rely on biomass fuels—mostly wood, charcoal, and animal dung—for household cooking and heating (17, 18, 35). In China, India, and sub-Saharan Africa, more than 80% of households use biomass fuels for cooking (119). These fuels do not burn cleanly. They emit large amounts of smoke, often directly inside dwellings without adequate ventilation (18, 35).

While rural areas may lack access to modern stoves or clean fuels, the urban poor often cannot afford cleaner fuels such as kerosene, natural gas, or electricity. They have no choice but to use biomass fuels (44). Women and children suffer most from indoor air pollution because they spend many hours each day in their homes, where often the air is polluted (35, 42, 44, 102, 118). For example, a study in Accra, Ghana, found that women faced particularly high levels of exposure to chemical pollutants, especially if they burned wood and charcoal for cooking (81). Infants and young children are exposed because they usually are carried on their mothers' backs or kept close to their mothers throughout the day (17).

Most urban air pollution initiatives focus on curbing outdoor pollution. Cleaning up indoor air, however, is also a compelling public health need (119). A number of approaches could help. Technical approaches include attaching hoods and chimneys to stoves to remove smoke; stove improvements that reduce emissions through more complete combustion; changing the design of kitchens to increase ventilation; and promoting the use of kerosene, liquefied petroleum gas, and electricity. Behavioral approaches include promoting awareness of long-term health effects and encouraging people to keep children away from direct exposure. Policy approaches include appropriate fuel pricing to encourage use of cleaner fuels and subsidies for the purchase of clean-burning appliances and clean fuels (16).

Impact on the Environment

Rapid urbanization can create enormous stresses on the natural environment. These stresses extend far beyond the land that urban areas actually occupy to affect the land that provides the resources to sustain urban life. Urban areas claim the ecological output and life-support functions of both nearby areas and distant regions (72). For example, urban areas take up just 2% of the earth's surface but account for about 75% of industrial wood use. Similarly, 60% of the water withdrawn for human use goes to urban areas—about half of that to irrigate food crops for urban residents, roughly one-third for use by industry, and the remainder for drinking and sanitation (83). The environmental impact of urban areas is often invisible to urban residents themselves because the ecosystems that support them may be far away.

The Urban Environment

As urban areas expand, so does their environmental impact. As the populations of cities in developing countries have increased dramatically, so have levels of per capita resource consumption, water and air pollution, and soil degradation and contamination (132). The extent of urban environmental impact increases not only as population grows but also as per capita demand for resources rises, both from industries and consumers (44, 132).

Another reason that environments are under pressure from urban growth is that the number of households has grown even faster than the population itself, reflecting a trend to smaller families and thus a decline in the average number of people per household. Analyzing data from 141 countries, a recent study calculated that the annual growth in the number of households (at 3.1%) was much more rapid than population growth itself (at 1.8%) between 1985 and 2000. More households naturally require more housing units, which increases the amount of land and materials needed for housing construction (70).

Urban expansion, environmental consequences. A range of economic, political, and social factors that determine how cities develop and respond to growth also have powerful effects on the environment (9). In particular, when urban development is unplanned and unregulated and urban areas expand haphazardly, urban living conditions usually worsen. As a result, the surrounding environment suffers—for example, through the unsanitary disposal of wastes and air and water pollution (44, 132).

Industrial development often takes place without concern for the environment or the living conditions of urban residents. Many developing countries choose to waive the few regulatory controls that exist in order to promote industrial growth. The absence of regulatory controls has often contributed to tragic industrial accidents—including the Bhopal, India, accident in 1984, when a Union Carbide plant released 30 tons of methyl isocyanate, a highly toxic chemical used in the production of pesticides. The resultant toxic gas cloud caused 3,330 deaths and 150,000 injuries (31).

Economic growth, while it provides jobs and improves living standards for some, often leaves others worse off and contributes to urban environmental problems. For example, as economic growth increases, so does the amount of waste generated per person (9, 31, 36). In many developing countries most waste is dumped in open sites, including wetlands, that are not able to contain seepage into local waters, or it is incinerated without proper air pollution controls (36).

The burden of urban environmental problems invariably falls disproportionately on the poor (44). When municipal governments do not collect solid waste, for example, poor people often have no choice but to dispose of their garbage in uncontrolled dumping areas to let it rot where it stands. Also, when governments do not help the poor gain access to suitable land for housing, many families settle in fragile areas such as wetlands or steep hillsides. Such families face great risk from natural and human-induced environmental hazards (44, 164).

These social conditions—for example, precarious settlement patterns—and environmental conditions—for example, makeshift housing that cannot cope with storm and surface run-off due to poor drainage—can combine catastrophically. For instance, in Payatas, Manila, in July 2000, heavy rains caused a rubbish dump to collapse, killing 218 people living in shanties at the bottom of the site (136).

Heavy Ecological Footprints

As urban areas grow and develop, they rely on natural resources from farther and farther away to meet their production and consumption demands. In the process, their "ecological footprint" weighs heavier and heavier on the natural environment (22, 83, 98, 99). The ecological footprint represents the land area necessary to sustain consumption and waste disposal of a specific population (22,

New York City. Urban residents in the US and other industrialized countries consume much more per capita than those in developing countries. Thus their impact on the natural resource base is heavier.

99). The concept provides a measure of the impact that a population has on nature.

In order to sustain the earth's ecosystem indefinitely, the ecological footprint of humankind should be only about 1.7 hectares of land per capita. At current levels of consumption, however, our ecological footprint averages about 2.3 hectares of land per capita. This level clearly cannot be sustained over the long term because it is about one-third larger than earth's natural capacity (147).

Urban residents in the industrialized world consume much more per capita than urban residents in developing countries consume. Thus most developed-country cities have much heavier ecological footprints. London's ecological footprint has been estimated at 120 times the surface area of the city, or about 20 million hectares (49 million acres)—nearly equal to the productive land area of Great Britain as a whole (22, 98).

At current consumption levels a typical North American city with a population of 650,000 requires about 30,000 square kilometers of land. In comparison, a similar sized city in India requires about 2,800 square kilometers (137). On average, slum dwellers in New Delhi, India, require only 0.8 hectares (2 acres) of land per capita to maintain their minimal life styles, while Americans in Boston or New York need 8.4 hectares (21 acres) of land per capita to support their consumption levels (147). Just as per capita consumption levels are much greater, the average urban resident in an industrialized country generates four to six times more waste than does the average urban resident in a developing country (132).

The calculation of ecological footprints for cities should not obscure the fact that certain enterprises and higher income groups contribute disproportionately to these footprints. The ecological footprint of a low-income household is much less than that of a wealthier one (43).

In industrialized countries over the past 25 years, per capita consumption levels have increased consistently at about 2.3% per year. In some developing countries, however, the increase has been even greater, while starting from a much lower base. In East Asia, for example, consumption has increased by an average of 6.1% per year, reflecting an increasing standard of living (137).

As population has grown rapidly in urban areas of developing countries, and per capita consumption levels have risen as well, resource use has soared. Worldwide, fossil fuel burning has increased five fold since 1950. Fresh water consumption has doubled since 1960. Consumption of wood is 40% greater than it was 25 years ago, and seafood consumption has quadrupled (137).

With greater resource consumption comes greater waste production. For instance, the average amount of waste generated each day in Rio de Janeiro in 1997 was 8,042 tons compared with 6,200 tons in 1994. Growing per capita consumption accounted for this rise. During the three-year period the population of the city itself grew hardly at all (137).

Ilene Cheprick

Cuernavaca, Mexico. As urban areas become more crowded, they must improve governance, build community participation, and help the poor.

Making Urban Areas Work

As urban areas in developing countries become ever more crowded over the next quarter century, governments and citizens will face a growing challenge: how to make urban areas work (13, 80). Increasingly, according to the UN Human Settlements Programme (UN-Habitat), cities will become the "test bed for the adequacy of political institutions, the performance of government, and the effectiveness of programs to combat social exclusion, protect and repair the environment, and promote human development" (137).

Today, few urban areas are equipped to meet the challenge (129, 136, 137). In 1987 the World Commission on Environment and Development reported that "in the space of one decade, the developing world will have to increase by 65% its capacity to produce and manage its urban infrastructure, services, and shelter—merely to maintain present conditions" (159). This goal was not met (128).

In fact, many urban areas are growing in population so fast that their economies, services, and infrastructures cannot keep up (12). Most developing countries lack the resources and ability to solve the complex and massive problems of their urban areas any time soon. Nevertheless, many can take steps to address urban problems better. Among other measures, they can improve urban governance, upgrade slums and provide alternatives to the creation of new slums, curb pollution, and manage waste disposal better.

Improving Urban Governance

Governance is more than government. It includes not only the organization of and relationships between political and administrative institutions but also the relationships among government, private institutions, and civil society (105, 142). The UN defines governance as "the

Profile: Singapore: The Planned City

Singapore is a city that leaves nothing to chance. As Michael Koh Soon Hwa, Director of Physical Planning in Singapore's Urban Redevelopment Authority, puts it, "Since Singapore is land-short and resource-short, we had to develop an extensive planning culture. Our survival and growth depended on it" (54).

"Singapore is an excellent example of how the combination of land use planning, urban planning, and transportation planning can help create a sustainable city for the 21st century," says Loh Ah Tuan, director of the Environmental Policy and Management Division in the Singapore Ministry of the Environment (123). With four million people squeezed onto an island of just 647 square kilometers, Singapore's urban planners have been able to control sprawl, and even expand parks and protected areas, by limiting highway construction, building public transportation networks, and enacting zoning laws that help people live and work in the same areas.

Singapore's urban planning preserves greenery, watersheds, and clean air.

Singapore decided to build up rather than allow uncontrolled sprawl to overtake limited land area. The city also built satellite towns connected to central Singapore by a rapid transit rail network and bus lines. At the same time, each satellite town is planned to enable residents to work in the community where they live, without long commutes to the city center or to other parts of the island.

The Concept Plan. The city's main planning tool is the Concept Plan, a strategic development framework that is updated every decade. The current plan, drawn up in 2001, sets broad-based development plans for the next half century. It allows for an eventual population of 5.5 million within 50 years. The Concept Plan specifies 55 detailed "development guide plans" that address land use needs, such as housing, commercial and industrial development, transportation, and recreational facilities. The planning process includes not only all government ministries but also citizens and communities and allows for local development planning by neighborhoods.

Housing. A feature that separates Singapore from virtually the rest of the developed world in urban planning is its housing policies. Fully 86% of all Singaporeans live in apartments (flats) built by the Ministry of National Development. Over 90% of Singapore residents own their own homes, a rate unmatched anywhere else. With such extensive home ownership comes more involvement in the city's civic affairs and attention to quality-of-life issues.

Protected water. Singapore has 2,158 hectares (5,332 acres) of protected watershed in the middle of the island. The watershed provides half of the city's freshwater needs. The island's four large water reservoirs have been protected completely from any development since 1860. This central watershed contains perhaps the world's only urban old-growth tropical rainforest. Singapore gets the rest of its water from next-door Malaysia through a long-term agreement with the state of Johor.

Waste disposal. Singapore's Environment Ministry operates six large sewage treatment plants, enough to serve the entire population. Each plant has two stages of treatment, and effluents are then discharged through out-falls into deep offshore waters. An experimental sewage treatment plant at Bedok, with three stages of treatment, produces effluents so clean that the water is used by the semi-conductor industry to manufacture silicon wafers.

The city is just as meticulous about disposing of its solid wastes. Four large incinerators reduce 85% of the city's solid wastes into fly ash that is then deposited in a monitored landfill located on an offshore island. A recently introduced recycling and re-use program expects to capture up to three-quarters of the paper, metals, and organic wastes generated by Singaporeans, transforming these wastes into useful products.

Controlling air pollution. Air pollution is not a problem in Singapore. In 2000, for example, the average level of nitrogen dioxide was just 30 micrograms per cubic meter of air, well below the US Environmental Protection Agency (EPA) standard of 100 micrograms per cubic meter of air. Similarly, the suspended particulate matter (mostly from industries, power plants, and incinerators) averaged only 10 micrograms per cubic meter. The EPA standard is 50 micrograms per cubic meter.

One reason for clean air is widespread use of public transportation. Only 1 Singaporean in every 10 owns a private vehicle, a fact attributed to the high tax on private vehicles. Another reason is the city's large amount of greenery. Trees and shrubs not only produce oxygen, but they also clean and cool the air.

Abundant green space. Singapore nurtures its "garden city" image. Currently, the city has 2,340 hectares (5,800 acres) of parks and green areas and about 3,000 hectares (7,400 acres) of nature reserves. When Singapore began to develop rapidly in the early 1970s, city planners formed a "garden city action committee" in 1973, with members from each of the main ministries. This group helped ensure the city's long-term commitment to setting aside and maintaining nearly one hectare (2.5 acres) of green space for every 1,000 people.

Singapore has recently embarked on a campaign to provide 245 hectares (600 acres) of "park connectors" by 2010—green corridors that will eventually connect every park and reserve on the island. The corridors will contain bike paths and hiking trails, affording residents more options for getting around the city.

This profile is based on interviews and reporting in Singapore by Don Hinrichsen in 2001. Sources: 115–117. Photo credit: Don Hinrichsen.

sum of ways through which individuals and institutions, both public and private, plan and manage their common affairs" (137).

How can urban governance improve? Around the world, a new consensus is emerging that national governments should not retain direct control over the planning and management of urban areas. Instead, national governments should act as enablers, creating legislative and administrative environments in which a wide range of local governments, private-sector firms, and community organizations can deliver infrastructure and services to urban areas (137). For example, national governments can focus on attracting favorable foreign investments, encouraging appropriate technology transfers, undertaking joint public-private initiatives to provide housing and basic services, and setting environmental standards (25).

Decentralizing power, authority, and responsibility from national to local governments can enhance local participation and encourage democratic practices. Decentralization can improve the effectiveness of public policy implementation and produce policies and programs that are both more efficient and more responsive to local preferences and needs (33, 40, 85, 137).

In general, three conditions must be met for decentralization to be effective. First, national and state authorities need to devolve budget authority to the municipal level (51, 110, 136, 156). In most countries the main sources of municipal revenues are local taxes and transfers from central to local governments (137). Officials at higher levels of government often are reluctant to relinquish financial resources to lower levels, however (85). Without this crucial revenue, municipal governments have little ability to operate.

Second, the administrative capacity of local governments must grow. Local governments often lack the experience of central governments. Local government officials and employees may need training in such areas as accounting, public administration, financial management, public communication, and community relations (140, 156).

Third, decentralization works best when it is inclusive—that is, when authorities ask about and respond to community needs and interests and when community members participate in decision-making. Community participation helps ensure responsiveness and accountability in public decision-making (137, 140, 141). Community leaders and residents know the problems they face and often can suggest effective solutions. Governments can help to ensure people's participation through elections and referenda, opinion surveys, and open meetings, and by setting up advisory groups or community oversight committees (85).

In Porto Alegre, Brazil, the local government in 1989 systematized and institutionalized public participation in the preparation of government budgets. Each year, citizens participate in two meetings organized by the local government. They rank their 5 top priority needs from a list of 14 needs, including education, housing, sewerage, and pavement. The local government uses this list to revise regional plans and budget allocations (121, 141).

Since this inclusive planning process began, remarkable gains have been made in improving conditions for the area's poor. In seven years the share of households with access to water increased from 80% to 98%, and the share with access to sewerage grew from 46% to 85%. The approach has been so successful that it has been replicated in 100 other Brazilian municipalities (141).

Improving the Lives of the Urban Poor

At the Millenium Summit in 2000, the UN General Assembly, represented by heads of states and governments from around the world, reaffirmed its commitment to eliminating poverty. Specifically, they agreed on a goal of improving the lives of at least 100 million slum dwellers by 2020 (127), focusing on upgrading the most squalid

Don Hinrichsen

In Bangkok, as in many other urban areas, slum dwellers often have little choice but to use unclean sources of water. Providing a clean water supply and improving sanitation would help prevent most water-related diseases and deaths.

and unserved urban slums and squatter settlements (24). This goal is modest, however, since the number of slum dwellers is projected to reach 1.5 billion by 2020 (86).

Poverty is likely to worsen and become pervasive if economic growth cannot keep pace with population growth. In contrast, slower population growth encourages economic growth, provided that governments institute sound social and economic policies (8, 73). Lower fertility in a country opens a "demographic window" of opportunity —a temporary period when a large group of working-age people supports relatively fewer older and younger dependents. This situation frees families and nations to save more and to make the longer-term investments that help lift people out of poverty. In order to reduce poverty, however, development efforts must be directed to helping the poor themselves, not only to stimulating aggregate economic growth (73, 143).

The role of local governments. "Pro-poor" social and economic policies that local governments can undertake include: relaxing restrictions on the informal labor market so that low-income groups have more opportunity to earn income; supporting small-scale enterprises by providing access to credit and land; creating jobs for people who would otherwise remain excluded from the labor market due to automation; investing in education and health, including reproductive health and family planning; and reducing gender inequality (51, 73, 143, 154).

Governments can effectively address some aspects of poverty at the community level, despite the limited ability of communities to generate economic growth (106, 154). Improving housing conditions and providing affordable and adequate basic services, such as water and sanitation, are among the most important ways to improve living conditions. Also, when housing and services are provided efficiently, people can spend less of their incomes on these necessities and thus have more for other essentials (45, 104, 132).

Many governments, however, lack the political will to assure affordable, legal housing (24, 44, 106, 158). Two of the most important components of policies to avoid slums are providing both access to land and financing for the poor (137). Governments often need to reform laws and regulations concerning markets for housing, land, and infrastructure. Also, reforming housing finance systems can give the poor more access to credit (154, 155).

Upgrading slums requires a variety of physical, social, economic, organizational, and environmental improvements. At a minimum, improving slums involves assuring basic infrastructure and services, such as a clean water supply and adequate sewage disposal. Other steps include constructing community facilities, such as health clinics, and enhancing income-earning opportunities by providing training and micro-credit (24, 154).

Fundamental to the success of a slum upgrading program is extending security of land and housing tenure to those who lack it (137, 154). Once people feel secure in their neighborhood, they are more likely to invest in their communities (32, 137). Granting security of tenure rights typically motivates occupants to invest two to four times the amount of money that the government invests in infrastructure improvements. Assuring tenure rights also results in more private investment—estimated at US$7 of private investment for every $1 of public funds (154).

An urban street market in Armenia. In many countries local governments could help small businesses by providing better access to credit and land, training, education, and health care.

Improving living conditions in slums need not cost governments enormous sums of money. When spread over a 20-year period, upgrading programs that would provide services to all slums in developing countries could be implemented at a total cost of 0.2% to 0.5% of Gross Domestic Product, according to the World Bank (154).

The role of communities. Community members must participate in programs to improve slums (154). When the poor organize and work together, as in community savings and loan groups, for example, they increase their power to negotiate with the government for land, infrastructure, and services. Over the past decade the urban poor have organized to create many savings and loan associations, often supported by nongovernmental organizations and international donors. Most operate with revolving credit funds set up by community associations. These associations give low-income households access to credit. In essence, the community as a whole acts as the guarantor for the repayment of individual loans (44, 137).

Community groups can often provide housing and services more cost-effectively than governments or private developers by pooling their resources and supplying their own labor. For example, in the Philippines it costs the government 250,000 pesos (US$1 equals 55 pesos) to build a 22 square meter dwelling in a relocation colony. The Philippines Homeless People's Federation, in contrast, can build a dwelling twice this size for 60,000 pesos. Furthermore, the federation can build roads, drainage, electricity, and water supplies for only 50 to 100 pesos per square meter of developed land, whereas private developers charge 550 pesos per square meter for the same work (146).

Sara A. Hollis, Peace Corps Volunteer

In Burkina Faso boys transport water to customers who lack access to piped water. Pricing water to reflect its scarcity is complex but can be crucial to meeting the demand.

The role of donors. The scale of urban population growth and the problems of urban poverty are unprecedented. Addressing them requires a long-term approach that emphasizes institution-building to increase the capacity of urban areas to respond (52). Urban planners increasingly agree with UN Secretary-General Kofi Annan that "good governance is perhaps the single most important factor in eradicating poverty and promoting development" (125).

Donor agencies can support better governance and, where government institutions are weak, increase funding to nongovernmental institutions to ensure that low-income groups benefit as intended (52, 106). Whenever possible, international donors should work through local partners, both to increase their credibility with the urban poor and because local partners know most about local problems and their potential solutions (52, 103).

Improving Water Supplies and Sanitation

With community participation, municipal governments can improve water supplies and sanitation. In the past 25 years, for example, Indonesia's Kampung Improvement Program has upgraded 11,000 hectares (27,000 acres) of slums and improved living conditions for 15 million people, providing sanitation, potable water, and garbage removal (136). Based on a strong partnership between urban communities and local governments, the program installed drains and sewers, laid thousands of meters of water pipes, built public bathing, washing, and toilet facilities, and provided receptacles and garbage carts for solid waste disposal (64).

Providing an adequate water supply and improving public sanitation are the two steps most needed to prevent the majority of water-related diseases and deaths in urban areas. For better sanitation, constructing sanitary latrines, building sewers, and treating waste water to biodegrade human wastes will help curb diseases (145). Such simple technologies as hand-pumps and improved latrines have benefited millions of people across the world (150).

Supplying water by managing demand. From both economic and environmental standpoints, saving water is more effective than trying to find or develop new sources of water. Managing the demand for water contributes to more efficient and equitable provision of clean water supplies (149).

Municipal governments often can improve water availability quickly by fixing leaky valves and water mains and cutting back on illegal taps, since up to 70% of the water pumped into cities in the developing world is lost before it can reach the intended consumers (136, 148, 149). Leakage is often a sizeable source of water loss. It results from either lack of maintenance or failure to update old systems. In urban distribution systems a major source of illegal connections may be contractors supplying new housing developments (135).

Pricing water to reflect its value as a scarce resource is crucial to saving water. Pricing water minimally or not at all encourages wasteful use. Cities often provide water at inordinately low prices to those who are connected to the water supply system—usually middle- and upper-class residential neighborhoods and central business areas. Water use fees may not even cover costs, let alone generate any revenue to pay for extending service to poorer neighborhoods (97).

Since access to water supply depends on income and location, conserving water by managing its price is complex. For example, for high-income and middle-income groups, the most effective water pricing measures include increasing rates and raising awareness about the importance of water conservation (149).

Measures to increase access to water often make water more expensive for the poor, who may not be able to afford water tariffs (149). Tariff structures designed to conserve water must penalize overuse but not restrict access for the urban poor. With tariffs in place, high-volume consumers, to some extent, can help to subsidize water for the poor (135).

Charging for municipal water connections does not necessarily deny water to low-income communities. In Tegucigalpa, Honduras, for example, six neighborhoods joined together and approached the city water authority with a request to provide piped water. Consumers themselves paid for the water connections. Nevertheless, the price that households paid for water dropped because residents no longer had to buy expensive water from street vendors. The quality of their water improved (97).

Often, potable water is used where lower-quality water would be acceptable. For example, potable water is some-

times used to flush toilets, wash vehicles, and clean streets. Instead, treated wastewater or urban runoff can be reused efficiently for some of these purposes and for irrigating crops (135).

Improving sanitation. More widespread use of two types of sanitation technologies—on-site and off-site—can help improve sanitation. On-site technologies dispose of wastes where they are created, as with latrines. Off-site technologies dispose of waste centrally, as in conventional sewerage treatment systems (50).

Better on-site sanitation can be achieved through greater use of dry nonflush latrines, which can be built cheaply, are easy to operate, and are inexpensive to maintain. In particular, they are suited to areas where water supply is limited and there is enough land to dig new latrines and fill up old ones (50).

Off-site technologies tend to have a much higher cost, require skilled labor for construction, and they need constant maintenance. Conventional sewers also require substantial water supplies (50, 113). With planning, they can be implemented at low cost in urban areas, however, as in the Orangi Pilot Project in Karachi, Pakistan.

The Orangi Pilot Project, an organization established in 1980, is one of the world's best known community efforts to provide affordable sanitation and wastewater management. The local government was unable to deliver an adequate sanitation system to Orangi, Karachi's biggest slum settlement. The Orangi Pilot Project proposed the installation of a self-financed and self-managed sewerage system. The project found a way to lower the cost of latrines and sewerage lines so that the poor could afford them (5). The project organized meetings for neighborhood residents to explain the benefits of improving sanitation (5, 44).

Once residents reached an agreement to improve sanitation, they elected a leader, who applied to the project for technical help. In response, project staff surveyed the neighborhood, made plans, and estimated costs of improving sanitation. The leaders informed the residents and collected money from them. Once the sewer system was installed, each neighborhood was responsible for maintenance (44).

To date the Orangi project has covered almost 84% of the settlement. Collectively, residents have raised about US$1.7 million to self-finance the construction of their sanitation system. More than 72,000 sanitary latrines have been installed, and 1.3 million feet of sewer lines have been laid (5).

Curbing Air Pollution

WHO estimates suggest that bringing suspended particulate matter in the cities of developing countries down to safe levels could save between 300,000 and 700,000 lives annually (29, 132, 162). In some urban areas of Latin America, high levels of air pollution make controlling vehicle emissions a top priority among public health needs (20, 69). The same can be said for some urban areas in Asia (see p. 11).

Transport systems need to be designed to move people, not vehicles. Reducing the dependence on private vehicles is a fundamental step that all urban areas can take (136). For example, Santiago, Brazil, is currently overhauling its transportation system to encourage more use of public transport and at the same time shifting the public transport system to clean technologies and alternative fuels (55).

In response to mounting health and environmental problems, a number of other cities also have taken steps to reduce air pollution, principally by providing better public transportation systems and reducing traffic (158) (see box, p. 15). Since 1998 Bogota, Colombia, has reduced motor vehicle use by building bicycle paths, restricting automobile use to certain hours in the day, and creating an effective bus system. Such actions have reduced air pollutants by 40% (158).

When combined with good public transportation, zoning is a key strategy for reducing vehicular air pollution. In Curitiba, Brazil, for instance, the city set aside tracts of land in urban and peri-urban areas for poor squatters to build low-cost housing connected to services such as potable water and garbage collection. The municipal government also introduced an extensive public transportation network to link outlying areas with the city center.

In Quito, Ecuador, school children investigate new recycling bins donated by the television show Arcandina*. Recycling urban waste is wise both environmentally and economically.*

Profile: Mumbai Cleans Up

Mumbai is one of the most populous cities in the world. It is also one of the most polluted cities (61). For example, Mumbai reports average levels of total suspended particulate matter in the air at nearly 240 micrograms, far exceeding WHO's standard of 60 to 90 micrograms per cubic meter (62). A number of innovative projects, however, show that individuals, governments, nongovernmental organizations, and businesses all can play roles in cleaning up the urban environment.

Mahim Nature Park

The Mahim Nature Park project highlights the importance of green spaces to cleaning up Mumbai and decreasing pollution levels (77, 94). Twenty years ago the 37-acre Mahim Nature Park was a city garbage dump, with slums on one side and the polluted Mahim Creek on the other (94). Today it is an ecologically restored nature park maintained by the Mumbai Metropolitan Region Development Authority (MMRDA).

In 1977 the World Wildlife Federation-India conceived and promoted the idea for a nature park (94). To develop and manage the park, the MMRDA appointed the Mahim Nature Park Society, which is responsible for day-to-day activities. The society's board of governors includes several top state government officials and leaders in environmental protection to ensure cooperation between local government and the scientific community (77).

As well as providing residents a green and unpolluted area, the Mahim Nature Park serves as an educational resource, offering instruction in ecology and nature conservation, particularly for children. The park is home to about 80 species of birds and 200 species of trees and other plants (77). The MMRDA has designated the park an outdoor laboratory for the study of the area's different habitats and the ecological functions of various species, including their role in traditional healing (94). The many visitors to the park range from children from local slums to naturalists from around the world (77).

Recyclers Organize

Mumbai's Parisar Vikas (meaning Eco-Development) is an association of some 2,000 female "rag pickers" who collect and recycle urban waste (109). These women are mostly deserted or widowed and without any male financial support for them or their children. They are forced into their occupation because of their poverty, illiteracy, and lack of skills. The women's organization Stree Mukti Sanghathana (Women's Liberation Movement) started the association in 1995. With 25 years of experience in the women's movement, Stree Mukti Sanghathana developed Parisar Vikas as a comprehensive approach to these problems (6).

The project, which is part of the Advanced Locality Management Programme of the Municipal Corporation of Greater Mumbai, was first carried out in the Basera Housing Society, a housing complex in a northwest suburb. It has since been replicated in several other housing complexes around the city (109).

The rag pickers visit a number of housing complexes to collect garbage, sell nonbiodegradable waste to recycling centers, and convert biodegradable wastes into compost for planting. The women go from house to house, encouraging families to put their "wet" (biodegradable) household wastes into buckets and showing them how the waste can be turned into organic compost. The rag pickers also sell bio-composting buckets (109).

In addition, rag pickers work at municipal garbage dumps to convert wet waste from the city's vegetable markets into compost. They produce an average of about 14 tons of compost every month, which they sell to farms and plant nurseries in and around Mumbai for about Rs.2,500 (US$52) per ton (109).

For their efforts the women earn a steady income of about Rs.75 (US$1.60) a day, which is above minimum wage. The work is difficult and often dangerous—involving the risks of handling sharp objects mixed in with the wet waste, breathing smoke from burning garbage dumps, working in the heat of Mumbai summers, and navigating pools of garbage during monsoons (109). Nonetheless, the work and its wages helped the rag pickers become organized and increased their bargaining power, while training in new skills has helped to increase their earnings (6).

This profile was prepared by Deepa Ramchandran based on the references cited.

The result is less pollution from vehicular traffic and more economic growth, as mass transit carries people more conveniently over longer distances to work, while fewer private vehicles clog the roads (21, 44, 75, 83, 111).

Setting aside more land for parks and green areas also helps curb air pollution and reduce urban temperatures. The "urban heat island" effect occurs when city temperatures run higher than those in suburban and rural areas as a result of the number of buildings and loss of vegetation (49). Urban heat islands accelerate the formation of smog, which damages the natural environment and endangers health. They also increase demand for cooling energy such as fans and air conditioners. Trees and other vegetation act as natural air conditioners, cooling the air while absorbing carbon dioxide and producing oxygen (71). For example, the Mumbai Metropolitan Region Development Authority in India developed and maintains a nature park to help clean up Mumbai and decrease pollution levels (see box, this page).

Recycling Wastes

Recycling mountains of urban waste into new resources makes sense both environmentally and economically. Recycling saves natural resources and reduces the amount of trash burned, buried in landfills, or dumped into rivers, lakes, and coastal waters. At the same time, for every one million tons of solid waste, about 1,600 recycling jobs could be created in developed and developing countries alike (78, 165).

Some industrialized countries now require companies that make plastic bottles and other throw-away items to recycle them as well (83). A few pioneering countries have already gone beyond recovery and recycling, promoting "industrial symbiosis," in which one company's waste becomes another company's raw material. For example, Kalundborg, Denmark, formed the first integrated industrial park two decades ago. Today, the companies drawn to this unique place have developed a sophisticated symbiotic process. A local power plant burns waste gases from an oil refinery. In turn, waste heat from the power plant warms commercial fishponds. Still other companies use the byproducts of combustion to make wallboard and cement. Hardly anything goes to waste (83).

In many poor countries unable to afford high-tech solutions, armies of "rag pickers" sort through garbage for items they can resell or recycle. Such an informal system not only provides a public service—one that many municipalities cannot afford—but it also provides employment and income (44). In Mumbai, for instance, an association of 2,000 women collects and recycles wastes from households and municipal dumps around the city (see box, p. 20).

A Way Forward

No single set of policies can meet all the challenges of an urban future. Rather, a sensible policy approach to managing urban governance is necessary, in which a full range of policy and program options is considered. Better governance is essential to improve urban living conditions. Integrated coordination at the national, provincial, and local levels is crucial. National governments should move towards playing the role of the enabler, while local governments move towards more direct control over the planning and management of urban areas (137).

For local governments to carry out these new functions, national governments need to devolve authority and resources to local governments. Furthermore, local governments need stronger capability, since they may have less experience than national governments. Public participation, particularly by local community members, is also vital to enhance decision-making (51, 110, 136, 137, 140, 141, 156).

Donor agencies can facilitate this process by re-evaluating the nature of development assistance. They can reallocate resources from funding short-term projects to financing long-term approaches that focus on building institutional capacity (52, 106). As institutional capacity strengthens, urban areas can adopt more comprehensive planning. Urban settlements are most likely to meet the challenges of population growth if planning and action take into account interrelated factors such as land use, slum upgrading, improved water supply, sanitation, and waste management, and more efficient transportation systems in addition to responsive governance.

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